

I claim:

- 5 I 1. A method for inspecting a BGA joint, comprising the steps of:  
finding a location of the BGA joint;  
improving the location using a fine locator;  
measuring, in a slice image, a plurality of diameters through the BGA joint  
at predetermined angles; and  
10 applying a rule to compare the measured diameters to an expected  
diameter.
- 15 2. A method for inspecting a BGA joint as claimed in claim 1, wherein the  
plurality of diameters are measured at the located center of the BGA joint.
3. A method for inspecting a BGA joint as claimed in claim 1, wherein the step  
of finding the location of the BGA joint comprises applying a centroid-based  
rough locator to the slice image.
- 20 4. A method for inspecting a BGA joint as claimed in claim 1, wherein the fine  
locator comprises:  
applying a plurality of locator windows over the BGA joint;  
locating two ball edges within a locator window; and  
determining a midpoint between the two ball edges.
- 25 5. A method for inspecting a BGA joint as claimed in claim 4, wherein locating  
two ball edges within a locator window comprises applying a derivative edge  
finder on either side of the BGA joint.
- 30 6. A method for inspecting a BGA joint as claimed in claim 5, wherein the step  
of locating two ball edges within the locator window is repeated for each of  
the plurality of locator windows.

7. A method for inspecting a BGA joint as claimed in claim 1, wherein the rule comprises calculating a sum in the form of:

$$\sum_{i=1}^N (D-d[i])^2$$

5 where D is an expected diameter and d[i] are the measured diameters.

8. A method for inspecting a BGA joint as claimed in claim 7, wherein the rule further comprises comparing the sum to a threshold.

- 10 9. A method for inspecting a region of interest, comprising the steps of:  
acquiring data corresponding to a number of horizontal slice images  
extending through an object of interest; and  
locating a best horizontal slice image from the number of horizontal slice  
images, the locating step comprising:  
15 computing, for at least two of the horizontal slice images,  
an amount of solder within each of the at least two horizontal slice  
images; and  
reviewing a distribution of the computed amounts of solder.